NHS
Manchester University
NHS Foundation Trust

Patient Information about the Cochlear Implant Operation

Manchester Royal Infirmary

Cochlear Implant Surgery

A cochlear implant takes over the function of the cochlea (the organ of hearing) which is no longer working effectively.

The internal part of the implant has two main parts – the receiver stimulator part and the electrode array part. The receiver stimulator part is placed on the surface of the skull bone under the skin behind the ear. A bed is usually created in the skull bone to accommodate the receiver-stimulator and it is fixed to the skull in a pocket under the muscle.

The other part of the implant is the electrode array, which is like a wire, that runs from the receiver stimulator package down through the mastoid bone, into the middle ear space under the ear drum and into the cochlea. In order for the electrode array to reach the cochlea, a passageway needs to be created by drilling through the bone of the mastoid into the middle ear space, where the outer surface of the cochlea can be seen. The surgeon will create a slot in the bone between the facial nerve and the ear drum to get into the middle space.

The facial nerve supplies the muscles on one side of the face and is responsible for facial movement. Once the cochlea is exposed a hole needs to be made through the bony wall of the cochlea. The cochlea is related to the balance system.

Risks

Cochlear implantation is a safe operation. Complications are very uncommon. However there are risks associated with any operation and those related to cochlear implantation are listed below:

Anaesthesia

The operation typically takes about 1-3 hours and is performed under general anaesthesia. There is some risk associated with any anaesthetic of this length, but this risk is very small. The anaesthetist will see you just before the operation to discuss any concerns you may have.

Facial Nerve Damage

In order to gain access to the cochlea the surgeon needs to drill very closely to the facial nerve. During this procedure it is possible that the nerve could be damaged. The damage would result in a weakness or paralysis of one side of the face. This could be temporary or permanent. It is an extremely uncommon complication (less than 1 in 1,000 permanent weakness). The nerve is monitored throughout the operation.

Failure to Implant

Sometimes there can be unexpected findings during the operation, such as infection or an unusual shape to the middle and inner ear that were not predicted by the scans. This may mean that it is not possible to insert the cochlear implant or that a second operation is required.

Wound Infection

If the wound becomes infected during the healing process it will often settle with antibiotic treatment. However sometimes antibiotic treatment alone may not be sufficient and it may be necessary to remove the implant.

If the implant needs to be removed then any hearing which was present in that ear before the operation is likely to be lost. Although this is a very uncommon problem it is an important consideration in patients with some hearing before surgery when deciding which ear to implant as the small amount of hearing they have could be lost. Usually it is possible to re-implant the ear at a later date.

Device Failure

An implant is electronic technology and so it is possible but rare, however good a company's quality control, that the device may stop working or malfunction. If it does the device can usually be successfully replaced but this will require another operation.

Device Movement

Rarely either the receiver stimulator or the electrode array may move following the surgery. If the receiver stimulator moves, it may become difficult to attach the external part of the implant or the two parts may rub and cause the skin to become sore or even damaged. It may be necessary to re operate to correct this or even remove the implant to allow healing to take place before reinserting a new one.

If the electrode array moves, there may be fewer electrodes available for hearing. In this situation, often the hearing improvement from the implant is still very good and nothing further needs to be done. We would only attempt to reposition the electrode surgically if the hearing was clearly reduced. Unfortunately the cochlea can fill with scar tissue in this situation and it may not be possible to insert the electrode array further.

Meningitis or CSF leak

The fluid inside the cochlea may sometimes be in contact with the fluid around the brain (the cerebro-spinal fluid or CSF). Sometimes the CSF can leak out through the hole created in the cochlea for the electrode array. It is also possible to cause a CSF leak when drilling the bed for the receiver-stimulator.

There is a risk that infection could enter the CSF causing meningitis. The risk of this happening is extremely small – around 1 in 4,000 cases. This risk is slightly higher in patients who have an abnormally formed cochlea. As a precaution we recommend that anyone undergoing cochlear implant surgery should have a 'pneumococcal' vaccination before the surgery. This protects against the most likely source of meningitis of this sort.

We also recommend that if the patient develops an ear infection in the months and years after the surgery that they receive early treatment with antibiotics. Please contact the cochlear implant centre for advice regarding the most appropriate treatment.

Outcome not predictable

Unfortunately, even with our sophisticated tests, it is not possible to accurately predict the outcome of the procedure. The degree of benefit can range from only hearing environmental sounds (door bells, telephones, microwave), to gaining help with lip reading, to being able to understand someone talking behind you, to using the telephone. Most patients are delighted with the benefit they gain from their implant. Unfortunately it is possible that you/your child may gain no benefit from the implant. Ensuring that you/your child have realistic expectations is a very important part of the assessment process.

Implant Damage

A blow to the head at the site of the implant may result in damage to the implant causing it to stop working. If this happens the device can usually be successfully replaced but this will require another operation. We would not recommend taking part in activities where there is a high risk of injury to the implant site.

Dizziness

As the balance system is so closely related to the cochlea, interference with this system during surgery or from infection is a possibility. This could result in balance problems which could be temporary or permanent. Dizziness and balance problems are uncommon after cochlear implantation.

Tinnitus

Tinnitus is a noise which is heard by the patient but is not actually present in the environment. It is an internally generated noise due to a problem somewhere in the hearing pathway. In other words it may be generated from a problem inside the cochlea, in the hearing nerve or in the hearing pathways in the brain. Cochlear implantation may have no effect on any tinnitus that you or your child already have; alternatively it may cause tinnitus, worsen tinnitus or improve or abolish tinnitus.

Taste change

Because the nerve for taste passes through the middle ear, it is not unusual for taste sensation to be altered for several weeks or months. This may cause a ‘tinny’ or ‘metallic taste’. This usually gets better by three months.

Electrical stimulation

The implant causes a tiny electric current to be produced in the cochlea. It is this current that stimulates the hearing nerve. Occasionally the electrical current can stimulate other nerves such as the facial nerve causing facial twitching or discomfort. This can usually be avoided by re-tuning or turning off the offending electrode(s). The long-term effect of the electrical current put out by the implant on the nervous tissue, or any other tissue is unknown. There is no reason to expect any detrimental effect.

Many patients report an improvement in their sound quality over years following the operation. We will not fully understand the results of this stimulation by electric currents until many patients have used these devices for many years.

After the Operation (Post-operative)

The majority of patients are able to go home on the same day as their operation. The following will occur following your/your child's operation:

- A head bandage will be kept in place for 2-3 hours.
- Antibiotics are routinely given during surgery and post op doses are prescribed to take home. Further antibiotics are not required.
- Some dull post-operative ear pain is expected. Pain relief such as paracetamol or ibuprofen will be given as needed.
- You should not wash your hair for 7 days after the operation and the incision should be kept clean and dry for one week. There may be a sticky dressing over the wound. This will be removed at the one week check up.
- There may be some numbness on the outer ear and around the incision area. This is normal and most of the numbness will be expected to fade over a period of time.
- Two weeks should be taken off work/school, for any further advice please see British Cochlear Implant Group website www.bcig.org.uk/safety
- Appointments will be made for a check-up one week after the operation.
- Activation of the implant will be arranged about three to four weeks after the operation.

Motivation

Cochlear implantation is a significant undertaking and a major step in anyone's life. The process is a partnership between the implant team and the patient or parents. It involves serious responsibilities on both sides and a successful outcome requires active participation by the patient/parents and a commitment of time and effort. The members of the implant team will do everything to achieve as good an outcome as is possible.

Developments in Cochlear Implants

The implanted device and the external speech processor device are under constant development and improvement. In the future it may or may not be possible to update the external device. Any cochlear implant will become out of date, meaning that for new patients a different device will be used.

Is There an Alternative to Surgery?

Yes. The alternative to surgery is to continue with hearing aids and lip reading or to learn sign language or a combination of all three.

Comments, Complaints, Concerns & Compliments

If you would like to provide feedback you can:

- Ask to speak to the ward or department manager.
- Write to us: Patient Advice and Liaison Services, Ground Floor, Entrance 2, Manchester Royal Infirmary, M13 9WL
- Log onto the Patient Opinion website www.patientopinion.org.uk/ – click on 'Tell Your Story'

If you would like to discuss a concern or make a complaint:

- Ask to speak to the ward or department manager – they may be able to help straight away.
- Inpatients can speak to a senior nurse or manager by contacting the Tell Us Today service on (0161) 701 1999.
- Contact our Patient Advice and Liaison Service (PALS) – Tel: (0161) 276 8686 e-mail: pals@mft.nhs.uk. Ask for our information leaflet.

We welcome your feedback so we can continue to improve our services.

Confidentiality

All patient information will be treated as confidential. Only those persons involved with the programme and its evaluation will have access to the records. Any data published in scientific journals will be pooled summary data without patient identification. Specific data on an individual patient will be published only with the specific written permission of that patient.

Other physicians, scientists, and technicians may be in the operating theatre for educational purposes.

I have read and understand the contents of this information sheet. I have been given adequate time to consider it and have discussed the above material with those whom I feel may be of benefit in my understanding of the above.

Signature of Patient:

_____

or Signature of Patient's Parent or Guardian:

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Date:

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Further information about cochlear implantation can be found at:
www.mft.nhs.uk/cochlear
www.bcig.org.uk

Questions

Please write any procedure specific questions in the space provided below.

Anaesthesia .....

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Facial Nerve Damage .....

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Failure to Implant .....

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Wound Infection .....

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Device Failure .....

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Device Movement .....

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Meningitis or CSF leak .....

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Outcome not predictable .....

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Implant Damage.....

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Dizziness .....

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Tinnitus .....

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Taste Change .....

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Electrical Stimulation .....

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No Smoking Policy

Please protect our patients, visitors and staff by adhering to our no smoking policy. Smoking is not permitted in any of our hospital buildings or grounds, except in the dedicated smoking shelters in the grounds of our Hospital site.

For advice and support on how to give up smoking, go to www.nhs.uk/smokefree.

Translation and Interpretation Service

It is our policy that family, relatives or friends cannot interpret for patients. Should you require an interpreter ask a member of staff to arrange it for you.

تنص سياستنا على عدم السماح لافراد عائلة المرضى او اقاربهم او اصدقائهم بالترجمة لهم. اذا احتجت الى مترجم فيرجى ان تطلب ذلك من احد العاملين ليرتب لك ذلك.

ہماری یہ پالیسی ہے کہ خاندان ، رشتہ دار اور دوست مریضوں کےلئے ترجمہ نہیں کرسکتے۔ اگرآپ کومترجم کی ضرورت ہےتو عملے کےکسی رُکن سے کہیں کہ وہ آپ کےلئے اس کا بندوبست کردے۔

ইহা আমাদের নীতি যে, একজন রোগীর জন্য তার পরিবারের সদস্য, আত্মীয় বা কোন বন্ধু অনুবাদক হতে পারবেন না। আপনার একজন অনুবাদকের প্রয়োজন হলে তা একজন কর্মচারীকে জানান অনুবাদকের ব্যবস্থা করার জন্য।

Nasze zasady nie pozwalają na korzystanie z pomocy członków rodzin pacjentów, ich przyjaciół lub ich krewnych jako tłumaczy. Jeśli potrzebują Państwo tłumacza, prosimy o kontakt z członkiem personelu, który zorganizuje go dla Państwa.

Waa nidaamkeena in qoys, qaraaboamasaaxiiboaysanu tarjumikarinbukaanka. Haddiiaad u baahatotarjumaankacodsoxubinka mid ah shaqaalahainaykuusameeyaan.

我们的方针是，家属，亲戚和朋友不能为病人做口译。如果您需要口译员， 请叫员工给您安排。

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TIG 120/10
Produced March 2013
Review Date Novermber 2020
(SF Taylor CM11003)